

Listing of Claims

This listing of claims will replace all prior versions and listings of claims in this application. Please amend the claims as follows:

1. (canceled)
2. (previously presented) The composite material of claim 38, wherein the material is substantially non-reactive with aluminum.
3. (previously presented) The composite material of claim 38, wherein the ceramic portion comprises silicon carbide, boron carbide, or titanium diboride, or mixtures thereof.
4. (original) The composite material of claim 3, wherein the ceramic portion comprises particulate silicon carbide having an average diameter of between about 5 micrometers and about 5000 micrometers.
5. (previously presented) The composite material of claim 38, comprising at least 50 volume percent carbide particles.
6. (original) The composite material of claim 5, comprising at least 60 volume percent carbide particles.
7. (previously presented) The composite material of claim 38, comprising between about 50 and 90 volume percent carbide, between about 32 and 7 volume percent aluminum oxide, and between about 18 and 3 volume percent aluminum.
8. (previously presented) The composite material of claim 38, comprising an essentially continuous ceramic portion.
9. (canceled)
10. (previously presented) The composite material of claim 38, comprising less than about five weight percent silica.

11. (original) The composite material of claim 10, comprising less than about one weight percent silica.
12. (canceled)
13. (canceled)
14. (previously presented) The article of claim 39, wherein the article is capable of contact with molten aluminum without significant reaction with the aluminum.
15. (original) The article of claim 14, wherein the article is selected from the group consisting of riser tubes, dies/molds, heater immersion tubes, thermocouple protection tubes, ladles, and stirring devices.
16. (previously presented) The article of claim 39, wherein the article has one or more surfaces to be exposed to friction or wear.
17. (original) The article of claim 16, wherein the article is selected from the group consisting of bearings, nozzles, bushings, valve components, liners, brake components, clutches, engine components, and turbine components.
18. (previously presented) The article of claim 39, wherein the article is an electrical conductor.
19. (original) The article of claim 18, wherein the article is selected from the group consisting of electric motor brushes, high temperature/hostile environment sensors, high temperature/hostile environment probes, electrodes, and current collectors.
20. (previously presented) The article of claim 39, wherein the article is a thermal management device.
21. (original) The article of claim 20, wherein the article is selected from the group consisting of heat spreaders, heat sinks, thermal diffusers, and substrates.
22. (previously presented) The article of claim 39, wherein the article absorbs and dissipates kinetic energy from high velocity projectiles.
- 23.-37 (canceled)

38. (currently amended) A composite material comprising at least about 50 volume percent boride or carbide, the composite material comprising a ceramic portion [[and]] having alumina and an aluminum alloy made by:

a. contacting a silica-bonded boride- or carbide-based preform with a molten aluminum alloy comprising between about 18 weight percent and about 95 weight percent silicon and aluminum;

b. allowing reaction between the aluminum and the silica in the preform to go substantially to completion; and

c. removing the composite material from contact with the molten metal.

39. (previously presented) An article comprising the composite material of claim 38.

40. (original) The article of claim 39, wherein the article is in substantially the same shape and size as the preform.

41. (original) The article of claim 39, wherein the article is selected from the group consisting of riser tubes, molds, heater immersion tubes, thermocouple protection tubes, bearings, nozzles, bushings, valve components, liners, electric motor brushes, high temperature/hostile environment sensors, high temperature/hostile environment probes, electrodes, current collectors, and armor.

42. (cancelled)

43. (previously presented) The composite material of claim 38, wherein the density of the preform is at least about 75 volume percent.

44. (previously presented) The composite material of claim 43, wherein the density of the preform is at least about 85 volume percent.

45. (previously presented) The composite material of claim 38, wherein the composite material is made from a preform that is sufficiently free of interstitial cavities to promote formation of composite material without travel of reactants through interstitial cavities.

46. (previously presented) The composite material of claim 38, wherein the composite material is made from a preform that is substantially totally immersed in molten aluminum alloy.

47. (canceled)

48. (canceled)

49. (currently amended) A ceramic/metal composite material comprising a ceramic portion comprising silicon carbide and boron carbide, and an alumina-aluminum binding phase, wherein the composite material has been substantially fully reacted with aluminum, and ~~The composite material of claim 47,~~ wherein the ceramic portion is formed from a preform comprising about 50 volume percent silicon carbide, about 15 volume percent boron carbide, and about 35 volume percent silica.